

## **INTEGRATED BIO-REACTOR MONITOR AND CONTROL SYSTEM**

### Abstract of the Disclosure

Systems and methods for automatically controlling conditions of a process are disclosed. In one example, a controller is programmed with a sequence of steps and parameters required to carry out a bioreactor process. The controller receives information related to a condition of the process over a first communication network, determines a control signal based on the received information and the programmed process, and sends the control signal over a second communication network to a benchtop utility tower. In one example, the utility tower can include transmitters for temperature, pH, and dissolved oxygen that send information related to a condition of the process to the controller over the first communication network, and an agitation system, a gas control system, a temperature control system and a pump control system that perform a control action based on the control signal affecting the process condition. The utility tower can include a computer with a human-machine interface that communicates with the controller over a third communication network.

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